

Appl. No. 10/798,495
Response Dated January 31, 2007
Response to Office Action dated July 31, 2006

Amendments to the claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1. (currently amended) An electric door lock that is interchangeable between fail safe and fail secure modes, comprising:

a housing for receiving the internal components of the door lock;

a latch bolt mounted within said housing and being movable between partially extended from and retracted into said housing;

a doorknob mounted to said housing and rotatable to retract said latch bolt; and

a solenoid assembly mounted within said housing that can be interchangeably arranged to cause said lock to operate a fail secure mode wherein said doorknob is prevented from retracting said latch bolt when said solenoid is not energized, or a fail safe mode wherein said doorknob is allowed to retract said latch bolt when said solenoid is not energized, said solenoid nested in place within said housing in both modes, wherein said solenoid comprises a solenoid body having a longitudinal bore, a plunger in said longitudinal bore, and a rod/tip assembly, said rod/tip assembly mounted at one end of said longitudinal bore when in fail secure mode, and the opposite end of said longitudinal bore when in fail secure mode, said solenoid assembly having a solenoid spring to allow operation in ~~fail safe and fail secure modes~~ mode, said spring having a spring rate and said solenoid assembly having a power curve, said spring rate of said solenoid spring substantially matching the power curve of said solenoid assembly.

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Claim 2. (original) The door lock of claim 1, further comprising a cradle mounted to said housing, said solenoid being nested in place within said housing by being mounted within said cradle, said solenoid being held in place by surfaces of said cradle and surfaces of said housing.

Claim 3. (previously presented) The door lock of claim 2, wherein said solenoid is nested within said housing without being directly affixed to said housing.

Claim 4. (currently amended) The door lock of claim 1, wherein said ~~solenoid assembly comprises a solenoid body~~, plunger is and red/tip assembly, said plunger mounted within said longitudinal bore and fully drawn into said solenoid body when said solenoid assembly is energized, said rod/tip assembly capable of being mounted to either end of said plunger to interchange said solenoid assembly between fail safe and fail secure modes.

Claim 5. (original) The door lock of claim 4, wherein said plunger and rod/tip assemblies operate on said lock internal components to allow operation in the fail safe or fail secure modes.

Claim 6. (currently amended) The door lock of claim 4 1, further comprising a solenoid spring when said lock is in said fail secure mode, wherein said solenoid spring provides a bias to urge said plunger to extend from said solenoid body when said solenoid assembly is not energized.

Claim 7. (original) The door lock of claim 6, wherein said spring is arranged between solenoid body and said rod and tip assembly, said spring being compressed between said solenoid body

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and rod/tip assembly when said solenoid assembly is energized to draw in said plunger.

Claim 8. (original) The door lock of claim 1, further comprising a hub mechanism with said doorknob mounted thereto and a coupling member, said coupling member movable between a first coupling position to allow said hub mechanism to rotate when said doorknob is rotated or a second coupling position wherein said hub mechanism is not allowed to rotate when said doorknob is rotated, said hub mechanism retracting said latch bolt when said hub mechanism is rotated.

Claim 9. (original) The door lock of claim 8, wherein said solenoid assembly is in the fail safe mode and causes said coupling member to be in said first position when said solenoid assembly is not energized.

Claim 10. (original) The door lock of claim 10, wherein said solenoid assembly is in the fail secure mode and causes said coupling member to be in said second position when said solenoid assembly is not energized.

Claim 11. (original) The door lock of claim 8, further comprising a locking lever operably arranged between said solenoid assembly and said coupling mechanism, said solenoid assembly causing the movement of said locking lever between first and second locking lever positions, said movement of said locking lever causing said coupling mechanism to move between said first and second coupling positions.

Claim 12. (original) The door lock of claim 11, further comprising a rocker arm operably arranged between said locking

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lever and said coupling member, the movement of said locking lever between said first and second locking lever positions causing said rocker arm to be moved between first and second rocker arm position, thereby causing said coupling member to move between said first and second coupling positions.

Claim 13. (original) The door lock of claim 1, further comprising a plurality of electrical switches to indicate the position of said lock internal components.

Claim 14. (original) The door lock of claim 1, further comprising a hub mechanism with said doorknob mounted thereto and said latch bolt comprises a latch retractor, said hub mechanism also comprising a latch bolt finger to engage said latch bolt wherein said latch bolt finger floats on top of said latch retractor.

Claim 15. (original) The door lock of claim 1, wherein said latch bolt comprises a one piece retractor to prevent damage to said lock internal components when said doorknob is forcibly turned.

Claim 16. (original) The door lock of claim 1, wherein said latch bolt comprises a retractor that melts at an elevated temperature so that said latch bolt cannot thereafter be retracted.

Claim 17. (currently amended) An electric door lock that is interchangeable between fail safe and fail secure modes, comprising:

- a housing for receiving the internal components of the door lock;

- a latch bolt mounted within said housing and being movable from partially extending from and retracted into said housing wherein said latch bolt comprises a retractor that melts at an

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elevated temperature so that said latch bolt cannot thereafter be retracted;

a doorknob mounted to said housing and rotatable to retract said latch bolt into; and

a solenoid assembly mounted within said housing and comprising a solenoid body having a longitudinal bore, plunger and rod/tip assembly, said plunger movably mounted within said longitudinal bore and drawn into said solenoid body when said solenoid assembly is energized, said rod/tip assembly capable of being mounted to either end of said longitudinal bore, to said plunger to interchange said solenoid assembly to cause said lock to operate in a fail safe or fail secure modes.

Claim 18. (original) The door lock of claim 17, wherein said plunger and rod/tip assembly are arranged in the fail secure mode wherein said doorknob is prevented from retracting said latch bolt when said solenoid body is not energized.

Claim 19. (original) The door lock of claim 17, wherein said plunger and rod/tip assembly are arranged in the fail safe mode wherein said doorknob is allowed to retract said latch bolt when said solenoid is not energized.

Claim 20. (original) The door lock of claim 17, further comprising a locking lever, said rod/tip assembly operable on one end of said locking lever, the other end of said locking lever operable on said doorknob.

Claim 21. (original) The door lock of claim 20, wherein the extension of said rod/tip assembly from said solenoid body moves said locking lever to a first lever position that causes said lock to operate in either the fail safe or fail secure mode, the

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retraction of said rod/tip assembly moving said locking lever to a second lever position that causes said lock to operate the other of either the fail safe or fail secure mode.

Claim 22. (previously presented) The door lock of claim 17, wherein said solenoid assembly is nested in place within said housing without being directly affixed to said housing.

Claim 23. (original) The door lock of claim 17, further comprising a cradle located within said housing, said solenoid assembly being nested in place within said housing by being nested within said cradle, said solenoid assembly being held in place by surfaces of said cradle and surfaces of said housing and said cover plate.

Claim 24. (original) The door lock of claim 17, further comprising a spring arranged between solenoid body and said rod/tip assembly, said spring being compressed between said solenoid body and rod/tip assembly when said solenoid assembly is energized to draw in said plunger, said spring having a spring rate that substantially matches the power curve of said solenoid.

Claim 25. (previously presented) An electric door lock that is interchangeable between fail safe and fail secure modes, comprising:

- a housing for receiving the internal components of the door lock;

- a latch bolt mounted within said housing and being movable from partially extending from and retracted into said housing, wherein said latch bolt comprises a retractor that melts at an elevated temperature so that said latch bolt cannot thereafter be retracted;

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a doorknob mounted to said housing;

a solenoid assembly nested within said housing;

a hub mechanism mounted within said housing with said doorknob mounted thereto and a coupling member, said coupling member mounted within said housing and movable between a first coupling position to allow said hub mechanism to rotate when said doorknob is rotated and a second coupling position wherein said hub mechanism is not allowed to rotate when said doorknob is rotated, said hub mechanism retracting said latch bolt when said hub mechanism is rotated; and

a locking lever mounted within said housing and operably arranged between said solenoid assembly and said coupling mechanism, said locking lever movable by said solenoid assembly between first and second locking lever positions which cause said coupling mechanism to move between said first and second coupling positions.

Claim 26. (original) The door lock of claim 25, wherein said solenoid comprises a solenoid body, a plunger within said solenoid body and a rod/tip assembly mounted to said plunger, said plunger being drawn into said solenoid body when said solenoid assembly is energized, said rod/tip assembly engaging said locking lever to move it between said first and second locking lever positions.

Claim 27. (original) The door lock of claim 25, further comprising a cradle located within said housing, said solenoid assembly being nested in place within said housing by being mounted within said cradle, said solenoid assembly being held in place by surfaces of said cradle and surfaces of said housing and said cover plate.

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Claim 28. (original) The door lock of claim 26, further comprising a conical spring arranged between solenoid body and said rod/tip assembly, said spring being compressed between said solenoid body and rod/tip assembly when said solenoid assembly is energized to draw in said plunger.

Claim 29. (previously presented) A solenoid assembly, comprising:
a solenoid body having a longitudinal bore, a coil surrounding said longitudinal bore;

electrical conductors to apply an electrical signal to said coil;

a plunger movably arranged within said longitudinal bore and drawn into said solenoid housing when said coil is energized; and

a rod/tip assembly mounted to said plunger; and

a solenoid spring mounted between said rod/tip assembly and said solenoid body to cause said solenoid to operate in either of a fail safe or fail secure mode, said solenoid spring compressed when said plunger is drawn into said solenoid body, said solenoid spring urging said rod/tip assembly to extend from said solenoid body when said coil is not energized, wherein said solenoid spring has a spring rate and said solenoid assembly has a power curve, said spring rate of said solenoid spring substantially matching the power curve of said solenoid assembly.

Claim 30. (canceled)

Claim 31. (original) The solenoid assembly of claim 29, wherein said plunger has first and second plunger ends, said rod/tip assembly capable of being mounted to said first end of said plunger and capable of being mounted to said second end of said plunger.

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Claim 32. (original) The solenoid assembly of claim 29, wherein said solenoid spring is a conical spring.